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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

JONES, MARCUS D

ART UNIT

PAPER NUMBER

3714

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/663,236	Applicant(s) LARSEN ET AL.	
	Examiner Marcus D. Jones	Art Unit 3714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,6-12,14-19,46-50 and 59-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6-12,14-19,46-50 and 59-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The amendment filed 23 December 2009 in response to the previous Non-Final Office Action (1 September 2009) is acknowledged and has been entered.

Claims 1, 6-12, 14-19, 46-50, and 59-61 are currently pending.

Claims 2-5, 13, 20-45, and 51-58 are cancelled.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claims 1, 6-12, 14-19, 46-50, and 59-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kang (US 6,009,210), Kanade et al. (US 6,151,009) and further in view of Edwards et al. (US PGPub 2003/0169907).**

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In reference to claims 1, 6, 7, 14, 15, 46, 47, 49, 50, 59 and 61, Kang discloses A method for processing interactive user control for a view of a scene displayed on a virtual window, comprising: identifying a head of a user that is to interact with the scene (col 1, ln 43-47 and col 3, ln 29-32); storing an initial frame of user image data representing the head of the user, said view of the scene comprises a view-frustum initially defined by a gaze projection of a location of the head through outer edges of the virtual window when the location of the head is substantially normal to about a center point of the virtual window (col 3, ln 29-35 and see Figures 1-3); tracking the identified head of the user during display of a scene, the tracking enabling detection of a change in location of the head of the user (Abstract), the tracking including, identifying a search region within a frame of the user image data; the comparing and adjusting for successive frames of the scene, wherein the comparing is performed with the initial frame of the stored image data (col 2, ln 34-43 and col 9, 17-44); repeating the identifying the search region, the comparing, and the adjusting for successive frames of the scene, wherein the comparing is performed with the stored initial frame of image data (col 2, ln 34-43 and col 9, ln 17-44); a computing device and a display screen in communication with the computing device configured to display image data defined through a view-frustum (see Figure 1, lead lines 20 and 21); tracking device is a camera (see Figure 1, lead line 10). Kang does not specifically disclose adjusting a scale of a scene according to a change in distance of the head of the user from a capture device and using a capture device having depth-capturing capability. Kanade teaches the use of a depth capturing camera for interaction with a view of a scene (Abstract).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to have modified Kang in view of Kanade to obtain distance or depth information from the object being tracked (Inherent of “depth camera”); determine any interaction such as occluding, shadowing, reflecting or colliding, and generate appropriate output based on said determination (Abstract).

With regard to the adjusted view-frustum defined by an updated gaze projection of the changed location of the head through the outer edges of the virtual window (col 2, ln 34-43 and col 3, ln 4-21)., The Examiner interprets this limitation as, “as the user moves his/her head, the view-frustum is changed to reflect said change.

In the Alternative, Edwards teaches a system that measures that eye gaze direction of each eye based on the head-pose measurement (pg 8, par 131-136). In turn, the eye-gaze can be used to navigate through game worlds (pg 11, par 189). The Examiner submits that in order to navigate a gaming environment using the teachings of Edwards, that it would have been obvious to a person having ordinary skill in the art that the view-frustum is constantly adjusted to the gaze of the user. Subsequently the gaze measurement is dependent on the measurement of the location of the head of the user.

In regards to laterally adjusting the view frustum in a direction opposite to the change in location of the head of the user (see col 3-4 of Kang), Applicant should respectfully note that the location of the user's head and the location of the view frustum are opposite each other (i.e. the user is facing the view). Thus, they have different orientation (i.e. the user's left is the view frustum's right). Furthermore, the Examiner

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interprets this limitation as 'as the user moves his/her head, the view frustum is changed to reflect the appropriate view perspective.' For example, if the user moves his/her head to the left, the vertex of rotational angle (i.e. the viewpoint around the viewing axis) will need to shift to the right (with respect to the user) to show the scene on the left of the user. Similar to if a person wants to move his/her head to see what is on the left, the back of the person's head has to move to the right while the person's view moves to the right to view the left.

In reference to claims 8 and 9, Kang, Kanade and Edwards disclose the invention substantially as claimed. Kang further discloses that the system requires a reference face image that must be captured for initialization (col 3, ln 30-31 and see Figure 1). Kang also discloses that to determine a head translation and orientation, the face tracker warps the reference face image to minimize the difference between the warped reference face image and the current face image (col 3, ln 34-36).

In reference to claims 10 and 48, Kang, Kanade and Edwards disclose the invention substantially as claimed. Kang further discloses that video games are well known in the art as virtual environments in a computer system (col 1, ln 26-40). Edwards also teaches playing computer and arcade games (pg 10, par 187).

In reference to claim 11, Kang, Kanade and Edwards disclose the invention substantially as claimed. Kang generally discloses a hands-free navigation system for tracking a head and responsively adjusting the display of a virtual reality environment (col 2, ln 43-45).

In reference to claim 12, Kang, Kanade and Edwards disclose the invention substantially as claimed. Kang further discloses an edge strength image is used rather than a direct intensity image. 2-D global motion is recovered by affine warping the reference face image (that has been taken during the initialization step 100) so as to minimize its intensity difference with the current image face. This is equivalent to deformable template matching with global motion (col 9, ln 20-33).

In reference to claims 16, 17, 18, 19, 49, 50 and 60, Kang, Kanade and Edwards disclose the invention substantially as claimed. Kang further discloses the system tracks the pose (i.e., translation and orientation) of the face and uses that information to move and orient the virtual environment accordingly. Furthermore, the entire face image is tracked without the use of a geometric face model. (col 2, ln 34-43 and 59-63 also col 4, ln 60-col 5, ln 49).

Response to Arguments

1. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.
2. The Applicant asserts that Kang and Kanade fail to teach a view-frustum defined by a gaze projection through a virtual window.
3. The Examiner respectfully disagrees.
4. The Applicant adds that the effective view-frustum is simply tied to the position and orientation of the viewpoint. The Examiner submits that viewpoint and gaze are also tied to one another. For example, as a player navigates through a virtual

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environment, the player may turn their head. While the player turns his/her head, their eye gaze may also be turned in the same direction, such that viewpoint and gaze are one in the same. Here, the combination of Kang and Kanade clearly disclose the claim limitations of the instant invention. There are also instances where viewpoint and gaze are different. Using the same example as a player turning their head, to the right for example, a player may also turn their eyes to the left. By doing so, the viewpoint and eye gaze result in substantially perpendicular planes. The actual viewed scene is then that of the direction of the gaze only, differing from the viewpoint defined by the location of the head. The addition of Edwards ties in the capability to navigate and continuously update the view based on eye gaze.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marcus D. Jones whose telephone number is (571)270-3773. The examiner can normally be reached on M-F 9-5 EST, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John M. Hotaling can be reached on 571-272-4437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Marcus D. Jones/
Examiner, Art Unit 3714

/John M Hotaling II/
Primary Examiner, Art Unit 3714